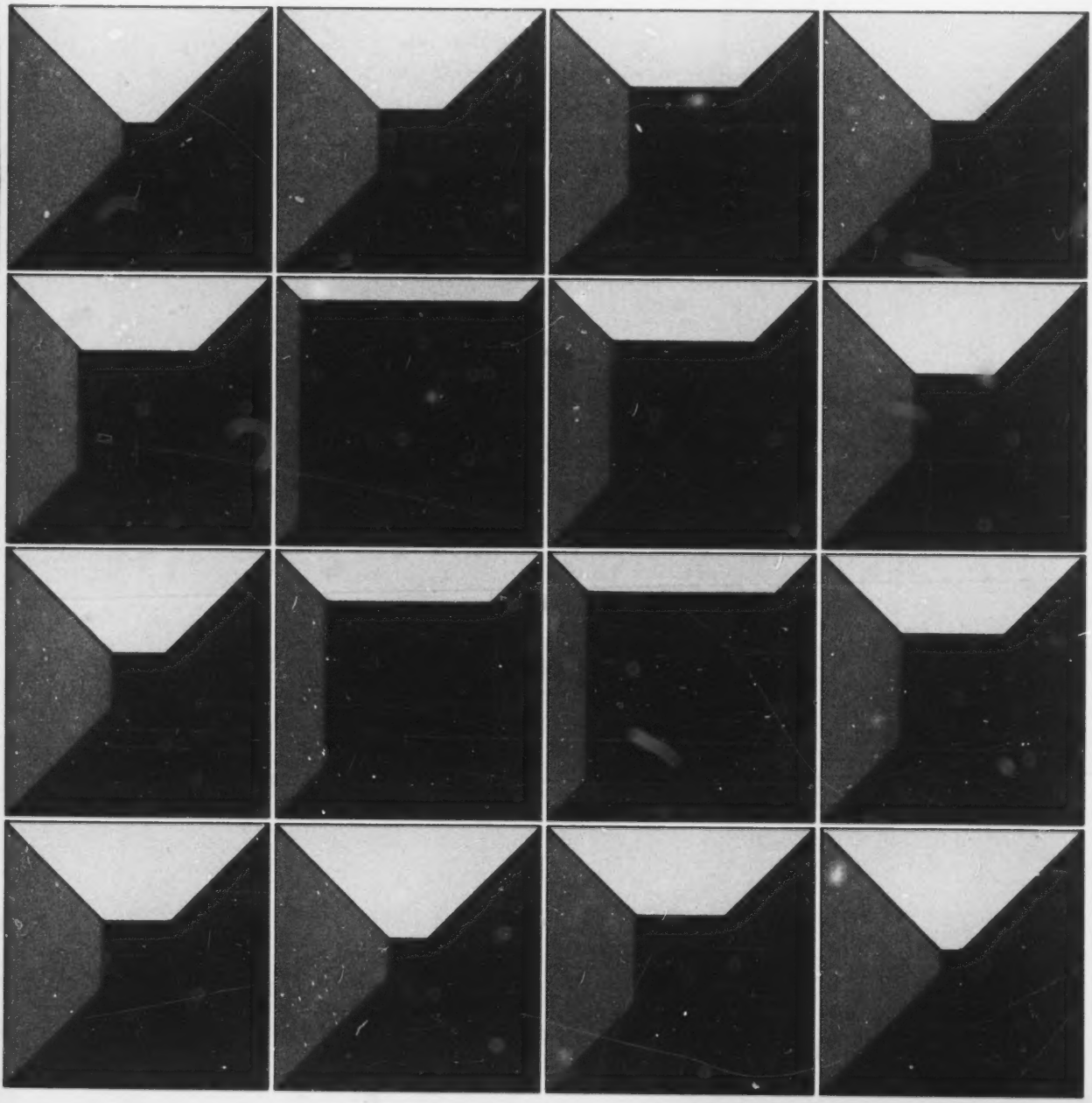
A CBO STUDY

Financial Options for the Highway Trust Fund

December 1982

Congress of the United States
Congressional Budget Office



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FINANCIAL OPTIONS FOR THE HIGHWAY TRUST FUND

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PREFACE

During the current session, the Congress is considering legislation that could change the scope and financing of the federal highway program. The nation's highways are in disrepair and the existing federal highway taxes are not sufficient to finance their restoration in addition to the current federal construction program. The Congress is faced with major strategic choices about how best to deal with these problems. The purpose of this paper is to review these choices and analyze their consequences.

The paper examines three options: (1) a continuation of the current pattern of spending and financing; (2) an increased highway program financed by the equivalent of an additional four-cents-per-gallon tax on motor fuel; and (3) a redefined federal role that would concentrate federal resources on roads of greatest national importance. The increased program option is very similar to that proposed by the Administration on November 30, 1982.

The Congressional Budget Office (CBO) prepared this report at the request of the House Committee on Public Works and Transportation and the House Committee on Ways and Means. In keeping with CBO's mandate to provide objective and impartial analysis, the study offers no recommendations.

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December 1982

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SUMMARY

Federal financing of highways has not kept pace with highway problems. Revenues from the motor fuels tax--the key source of highway funds--have stopped growing in recent years because a slowing of the increase in automobile travel and improved fuel economy have halted the historical upward trend in gasoline consumption. Compounding this, inflation has eroded the purchasing power of the revenue that is available. This decline in spending power has made it more difficult to deal with the condition of the nation's highways.

In recent years, the principal need of the highway system has shifted from new construction to repair. Many parts of the Interstate highway system are nearing the end of their designed lives and thus require greater maintenance than before; other Federal-Aid highways and bridges have also deteriorated in serviceability. But these repair needs also compete for resources with completion of the Interstate system, which, as now defined, would require more funds than are currently authorized for that purpose. Solving these problems will require increases in federal highway user taxes, increases in state responsibilities together with state user fees, or both.

Sooner or later, the central problem--the deterioration of the nation's major roads--will be taken care of: the economic costs of doing otherwise are simply too high to permit deterioration to continue unabated. The gain in economic efficiency from facing this problem sooner, rather than later, appears clear.

THE PROBLEM

The highway financing problem has two components: rapid growth in the expenditures that appear to be required, and much slower growth in the revenues obtainable under current law.

Need for Increased Spending

There can be no single definition of "need" for infrastructure components such as highways. Rather, needs are conditional on the desired quality and extent of the national highway system. Recognizing this difficulty, highway needs as now understood can be grouped into two principal components: repair, and completion of the Interstate system.

Growing Repair Costs. The physical condition of the nation's highway system has deteriorated in recent years both because spending has not kept

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pace with highway use and because the highway system has aged. For example, nearly half the mileage of the Interstate system has exceeded its estimated design life of 20 years. As a result, over 7 percent of the Interstate system is classed in poor condition today, while virtually none of it was in poor condition ten years ago. The Interstate is particularly important since it carries 19 percent of total traffic even though it represents only 1 percent of total mileage. But other parts of the road system are also in disrepair. Over 20 percent of the bridges have significant structural problems, and about two-thirds of the non-Interstate roads are in poor or fair condition.

Estimates of the extent of these problems, as well as estimates of the costs of correcting them, are necessarily imprecise. Recognizing this imprecision, it nevertheless appears that federal expenditures averaging about $8.8 billion per year for the next four years would be necessary to repair poor roads on the Interstate system and to prevent further deterioration of other parts of the Federal-Aid system. These repair costs include:

- Around $2.9 billion per year for Interstate routes;
- Perhaps $2.9 billion annually for Primary routes;
- Roughly $1.0 billion and $0.7 billion for Secondary and Urban roads, respectively; and
- About $1.3 billion a year for structurally deficient bridges on the entire Federal-Aid system.

Cost of Interstate Completion. About $6.2 billion per year will be required between now and 1990 for completion of the Interstate Highway System ($5.1 billion) and to help the states with upgrading work on parts of the system that are of predominantly local interest ($1.1 billion). As currently planned, completion of unbuilt parts of this system would cost a total of $32.6 billion (in 1982 dollars) by 1990, the scheduled completion date. This sum could be reduced to $13.3 billion (in 1982 dollars) if federal funds were concentrated on only the essential gaps in the system.

Current authorizations for Interstate completion come to $3.2 billion per year. This is far short of the annual expenditures needed to execute current plans, but would be adequate if federal resources were targeted only on construction of essential gaps.

Summary of Needs. Under current practices, the federal share of the costs just outlined for the Interstate and other systems would total $15.0 billion a year, about two-thirds more than the $9 billion authorized for 1982. Of this sum, the needs with the highest federal priorities appear to cost about $9.3 billion: $2.9 billion for repair of the Interstate, $2.2 billion for completion of the most important gaps in the Interstate, $2.9 billion for Primary route repairs, and $1.3 billion for bridge repairs. This implies that

if the federal role was redirected in a way that funded only the highest federal priorities, funding levels close to those now authorized would suffice. But to the extent that the balance of the nation's highway needs are to be met with federal funds, sizable increases in federal resources appear to be required.

Slow Growth in Highway Revenues

The chief highway user fee, a four-cent-per-gallon tax on motor fuels, will generate about $4.4 billion each year during the next five years, even though increases in future construction costs will substantially diminish the purchasing power of these revenues. Over the next four years, total revenues entering the Highway Trust Fund from all sources, including interest, will grow by less than 2 percent per year, while inflation in highway costs is likely to be far greater. As a result, existing highway user taxes will not keep up with inflation, much less begin to address the problems of deferred maintenance and Interstate completion.

PROGRAM AND FINANCIAL OPTIONS

To address these financial pressures, this paper examines three strategic choices in highway policy. The first strategy is a continuation of current spending patterns similar to that proposed by the Senate Committee on Environment and Public Works earlier this year (S. 2574). A second strategy would increase highway-user taxes and program levels so that they more closely matched the apparent needs of all federally aided routes. This approach, called the "increased program levels" option, is modeled on the bill introduced by the House Committee on Public Works and Transportation during the last session (H. R. 6211). This is very similar to the highway bill proposed by the Administration during the final session of the Ninety-seventh Congress. The third strategy, called a "redirected federal role," would concentrate federal resources exclusively on routes of national importance, and return to the states full responsibility for all other roads. (See Summary Table 1.)

Current Spending Patterns

By continuing the current spending patterns, the Congress could defer an increase in highway user fees. As a result, the major federally aided road systems would continue to deteriorate, and not all gaps in the Interstate Highway System would be completed by 1990. The cash balance in the Highway Trust Fund would drop from its current level of about $9.0 billion to around $4.6 billion in 1987. In the long run, however, even this program level could not be sustained without drawing the cash balance down so low that increased taxes would be required.

SUMMARY TABLE 1. COMPARISON OF THREE ALTERNATIVE HIGHWAY PROGRAMS WITH CURRENT HIGHWAY AUTHORIZATIONS AND ESTIMATED HIGHWAY NEEDS (In billions of dollars)

Program Area	1982 Authorizations	Estimated Needs 1983-1986	Average Annual Authorizations 1983-1986		
			Current Spending Pattern a/	Increased Program Levels b/	Redirected Federal Role c/
Interstate Construction	3.2	5.1	3.4	4.0	2.2
Interstate Repair	0.8	2.9	1.6	2.6	2.9
Interstate Upgrading		1.1			1.9
Primary System	1.5	2.9	1.6	2.2	2.9
Bridge Repair	0.9	1.3	1.2	1.7	0.6
Secondary System	0.4	1.0	0.5	0.6	0.0
Urban System	0.8	0.7	0.7	0.8	0.0
Other d/	1.4	e/	0.7	1.5	0.0
Total	9.0	15.0	9.6	13.5	10.5

NOTE: Totals may not add due to rounding.

a. Based on S. 2574 proposed by Senate Committee on Environment and Public Works.

b. Based on H. R. 6211 proposed by House Committee on Public Works and Transportation.

c. Assumes turnback to states of all non-Interstate and non-Primary roads and non-Primary bridges.

d. Interstate transfer grants, safety programs, development highways, etc.

e. Not estimated.

Increased Program Levels

The four-year program approved in 1982 by the House Committee on Public Works and Transportation (H. R. 6211) would increase highway authorizations by about 50 percent over the 1982 level to an average of $13.5 billion per year, an amount close to the current definition of federal highway needs. The largest increases are for areas with the largest highway problems--Interstate repair, bridges, and the Primary system. While Interstate construction would be increased to $4 billion a year, this is still about $1 billion a year short of what is needed to complete the system by 1990. A program of this magnitude would require a tax increase equivalent to an increase in the motor fuels tax from the current four cents per gallon to eight cents per gallon. This would generate $4.4 billion in additional revenues for highways. Rather than raising the motor fuels tax alone, however, a carefully balanced set of increases in all road user taxes would be preferable if each type of vehicle is to pay its fair share of program costs. To aid in setting these taxes, the Department of Transportation recently completed a study of highway cost allocation, estimating the cost responsibility of each group of highway users. 1/ This study concluded that, in general, automobile users paid their share of federal highway costs, while light trucks overpaid and heavy trucks did not pay enough in user taxes.

Redirected Federal Role

As an alternative to increased federal highway taxes, available funds could be targeted exclusively on roads in which there is a predominant federal interest. Under this option, federal funding would average $10.5 billion a year and be concentrated on the Interstate and Primary routes--roads that carry almost half of all vehicle miles but account for only 8 percent of the route miles. Responsibility for the remaining highways would be retained by or returned to state and local governments. This transfer would place a significant burden on the states, since they would need to offset almost $2.6 billion a year in federal funds either by way of tax increases or by reduced spending on these roads. To aid the states in assuming this burden, some federal user tax receipts could be turned back to them during a transition period that would permit states eventually to expand their own user taxes to match their increased responsibilities. Such a turnback in federal receipts would require a temporary increase in federal user fees because adequate financing of the federal-interest parts of the program would itself exhaust the revenues available under the current user tax rates, leaving no surplus for turning back.

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1. U. S. Department of Transportation, Final Report on the Federal Highway Cost Allocation Study (May 1982).

EVALUATION OF OPTIONS

The Congress appears to face two strategic alternatives to the current highway policy: increasing spending to keep pace with needed repairs; or reducing the federal highway role by turning back to states the responsibility for all roads and programs that do not serve predominantly federal interests. Summary Table 2 captures the salient characteristics of these options.

If current policies were continued, the federal expenditure on roads could be held down, but needed repairs would continue to be deferred because of inadequate funding. While this approach could avoid an increase in highway taxes for at least several years, it would also intensify the financial pressures on state governments.

The increased spending option would be more expensive for the federal government, at least in the short run. However, it could hold down the long-run costs of keeping the nation's essential routes in safe and economic operating condition. This could, in turn, provide important gains in long-run economic efficiency. The greater expenditures would require an increase in federal user fees equivalent to a fuel tax of four cents per gallon. On the other hand, this would provide some short-term help in reducing the federal deficit, because highway tax receipts would increase more rapidly than highway spending.

The redirected federal role would ensure adequate funding for the routes that carry nearly half of intercity highway traffic. The central advantage of this option is that it would better align the highway responsibilities of each level of government. This program could be financed without a tax increase, although it would add to the federal deficit in the near term and might suddenly increase state financial responsibilities. In order to ease the transition for state governments, the federal government could temporarily provide financial backing to the states that would more than cover their new program responsibilities. A temporary federal tax increase of 2.4 cents per gallon would generate $2.6 billion that could be phased out once the states had time to get their own programs and financing established.

SUMMARY TABLE 2. SUMMARY OF MAJOR HIGHWAY OPTIONS

Criteria	Current Spending Pattern	Increased Program Levels	Redirected Federal Role
Average Annual Authorization, 1983-1986 (In billions of dollars)	9.6	13.5	10.5
Adequacy to Meet Highway Needs	Not adequate	Generally adequate; more funds would be required for Interstate repair	Adequate for Interstate and Primary; all other systems would rely exclusively on states
Timing of Tax Increase	Could wait until 1987	Necessary now	Could wait until 1986
Burden on States	Current financial pressures on states would continue to mount as federal aid remained inadequate	No burden. The increase in federal programs would help alleviate financial pressure on states	Major increases in state activity would be required, often forcing states to increase state user fees
Effect on Long-Run Costs of Maintaining Essential Roads in Repair	Costs would probably be driven up by inefficient deferral of repairs	Costs would be reduced if increased funding was targeted on needed repairs to essential routes	Costs for Interstate and Primary would be reduced
Effect on Deficit	Deficit would increase by $4.4 billion over four years	Deficit would decrease by $5.4 billion over four years a/	Deficit would increase by $5.5 billion over four years

a. Does not include any reduction in receipts from income taxes.

CHAPTER I. INTRODUCTION

The federal government faces a major long-run policy decision about its role in financing the nation's highways: either it must greatly increase its effort or it must redefine more narrowly its role in building and repairing roads. Currently, federal spending is not keeping up with needs, and the condition of federally aided roads has deteriorated as a result. If policies are not changed, the condition of the system will continue to worsen. Such an outcome would be economically unsound since about one-quarter of U. S. industrial output moves over federally aided roads, as does 85 percent of all intercity passenger travel. Even a modest deterioration of this infrastructure could mean substantial losses to industrial and personal users of the system. While some parts of the federal highway program may be challenged as inessential, the question for the vast bulk of highway spending is not so much whether the funds should be spent, but rather who--the federal government or the states--should spend them.

Sooner or later, the key problem--the deterioration of the nation's major roads--will be addressed. The costs of permitting it to continue are simply too high. The gain in economic efficiency from facing this problem sooner, rather than later, appears clear.

While the dollar dimensions are arguable, more funding is crucially needed for two activities:

- Repair of existing roads and bridges; and
- Completion of the Interstate Highway System.

This paper compares current federal highway policies to two alternative approaches: increased spending more closely matched to needs but requiring higher taxes on highway users; and a program based on a restricted federal role that could be financed in large part from current highway user receipts.

The options differ in terms of how soon they face up to the highway problem and how they distribute the financial responsibility between state and federal governments. They also differ in the tax increases they would require, the funds they would make available, the burden they would place on state and local governments, and their impact on the federal deficit.

Chapter II summarizes the current federal highway highway program and its problems. Chapter III describes the Highway Trust Fund used to finance the program, and the resources currently available. Chapter IV presents the three highway options that are likely to be before the Congress in the near future. Chapter V assesses the three options in terms of

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economic efficiency, their effects on highway user taxes, their adequacy in meeting the highway problem, their compatibility with state programs, and their effect on the overall budget deficit.

CHAPTER II. THE FEDERAL-AID HIGHWAY SYSTEM

Almost all of the approximately $9 billion that the federal government annually spends on roads is devoted to a selected set of roads called the Federal-Aid system. In addition to 260,000 bridges, the system comprises: over 40,000 miles of expressways in the Interstate network; 260,000 miles of major arterials in the Primary system; and 520,000 miles of collector routes in rural areas (called the Secondary system) and in urban areas (called the Urban system). The Interstate system is very heavily travelled, carrying about 19 percent of all the nation's highway traffic on only 1 percent of the mileage. Combined, all five parts of the Federal-Aid system carry 80 percent of the nation's traffic on only about 20 percent of the highways (see Table 1). Truck traffic is particularly concentrated on major Federal-Aid routes: in 1977, the Interstate system carried 19 percent of passenger vehicle traffic but 45 percent of all travel by combination trucks.

The 1982 federal highway authorization contained more than 30 separate programs, over 90 percent of which are financed by the Highway Trust Fund (see Table 2). 1/ For 1982, about $9.0 billion was available for federal highway spending, of which 80 percent was accounted for by the six largest programs:

- o $3.1 billion for completion of unbuilt Interstate routes;
- o $1.5 billion for the Primary system;
- o $900 million for bridge repairs, including some bridges on state-financed or county-financed routes;
- o $800 million for the Urban system;
- o $800 million for repair and reconstruction of Interstate highways (also known as the 4R program for "resurfacing, restoration, rehabilitation, and reconstruction"); and
- o $400 million for the Secondary system.

The rest of the federal highway program includes a miscellany of programs serving a wide variety of purposes. These include economic

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1. Recent House and Senate highway bills, as well as earlier proposals by the Administration, would shift most highway programs now paid for by the general taxpayer into the trust fund.

TABLE 1. MAJOR PARTS OF THE NATION'S HIGHWAY SYSTEM

	Route Miles	Percent of Total Vehicle-Miles	Percent of Capital Spending Provided by Federal Government a/	Percent in Poor Condition	Percent in Fair Condition
Federal-Aid Highway System					
Interstate	41,216	19.0	91 b/	7.0	29.0
Primary c/	259,240	29.5	70	6.0	52.0
Secondary	398,108	8.7	25	9.0	66.0
Urban	124,115	21.9	20	8.0	59.0
Bridges	259,950 d/	N/A	70	10.5	15.5 e/
Total Federal-Aid Highways f/	822,679	79.1 f/	50	7.9 f/	58.7 f/
Non-Federal-Aid System					
Roads	3,034,179	20.9	N/A	N/A	N/A
Bridges	313,700 d/	N/A	N/A	33.4	27.4
Total Roads and Highways f/	3,856,858	100.0	N/A	N/A	N/A

SOURCE: Federal Highway Administration Highway Statistics for 1980; and The Status of the Nation's Highways: Conditions and Performance (January 1981).

a. U. S. Department of Transportation, Final Report on the Federal Highway Cost Allocation Study (May 1982), pp. iv-14. These estimates exclude maintenance.

b. Federal aid also accounts for about 90 percent of 3R (resurfacing, restoration, and rehabilitation) work on the Interstate, up from 50 percent in earlier years when federal aid for 3R was much less. In states with large areas of federally-owned land, the percentage is higher than 90.

c. Excludes Interstate mileage.

d. Number of bridges.

e. These bridges do not have adequate capacity for existing traffic or do not meet current design standards although their structural condition is adequate.

f. Excludes bridges.

development work, specifically identified projects (the Great River Road and most of the demonstration projects), and safety-related grants. In recent years, the total funding for these miscellaneous programs has declined--funds have not always been appropriated, and some authorizations have been phased out. Major programs currently financed outside the trust fund include the Appalachian Regional Commission and Interstate transfer grants used for highway projects.

Federal funds accounted for about half of the spending for construction and major repair of the Federal-Aid highway system, and for less than 30 percent of the total spent by all levels of government on roads and bridges (around $37 billion in 1982). State governments supplied about half the total spending; cities, counties, and other local governments provided the balance. Most state and local spending goes for roads that are not included in any of the federal systems sketched above, and for the more locally oriented federal systems (primarily the Secondary and Urban systems), as well as for routine maintenance on all road systems.

HISTORICAL OVERVIEW

Federal highway spending has passed through several cycles since the modern highway program began in 1916. In its early years, highway spending was dominated by local governments while the federal program concentrated on roads needed for interstate commerce--a system that eventually became known as the Primary system. 2/ Since the beginning, state governments have assumed all day-to-day control over the highway system; the federal government has functioned as a financier, providing funds to the state highway departments that planned, constructed, and maintained the roads. Over time, the federal program expanded by adding new programs of aid for rural and urban roads that served as collectors for the primary roads. The rural collectors became the Secondary system in 1946, and the urban collectors became the Urban system in 1974. In the process, the mileage included in the Federal-Aid system grew from 169,000 in 1923 to 820,000 at present--or from 5 percent of the nation's roads in 1923 to over 20 percent.

As high-speed highway travel became technologically possible, the federal government updated its core program for major intercity arterials--the Primary system--by beginning an entirely new, advanced system of intercity highways known as the Interstate system. Earlier federal aid had essentially financed state-initiated projects as long as they fitted into certain program ground rules. For example, the program for the Primary system had permitted states to designate (subject to federal approval) the routes that were to be parts of the system. Limits were placed on how large a portion of a state's highway system could be classified as primary routes

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2. For more details, see Congressional Budget Office, Highway Assistance Programs: A Historical Perspective (February 1978).

TABLE 2. HIGHWAY PROGRAM AUTHORIZATIONS IN FISCAL YEAR 1982, BY SOURCE OF FUNDS AND PROGRAM (In millions of dollars)

Source of Funds and Program	Authorization	Amount Available for Spending in 1982
Programs Financed by the Highway Trust Fund		
Interstate system	3,100.0	3,100.0
Interstate apportionment	125.0	125.0
Interstate 4R a/	800.0	800.0
Federal-Aid Primary	1,500.0	1,500.0
Federal-Aid Secondary	400.0	400.0
Federal-Aid Urban	800.0	800.0
Forest highways	33.0	33.0
Public lands highways	16.0	16.0
Economic growth center development highways	50.0	50.0
Emergency relief	100.0	100.0
National Highway Traffic and Safety Administration	100.0 b/	92.5
Highway safety R&D (NHTSA)	31.0	23.8
Federal Highway Administration (FHWA) safety grants	10.0	10.0
Highway safety R&D (FHWA)	13.0	4.9
Bridge reconstruction	900.0	900.0
Elimination of hazards	200.0	200.0
Pavement marking	65.0	65.0
Rail-highway crossings	190.0	190.0
Accident data collection	5.0	1.0
Programs Financed Jointly by the Highway Trust Fund and General Revenues		
Bicycle program	20.0 c/	0.0
Great River Road	35.0 d/	25.0
Demonstration projects for railroad/highway crossings	100.0 e/	0.0

(Continued)

TABLE 2. (Continued)

Source of Funds and Program	Authorization	Amount Available for Spending in 1982
Programs Financed by General Revenues		
Forest development roads and trails	140.0	313.7 f/
Public lands development roads and trails	10.0	18.0 g/
Public roads and trails	30.0	0.0
Parkways	45.0	3.5
Indian reservation roads and bridges	83.0	47.2
Appalachian development highways	140.0	140.0
Administration expenses for highway beautification	1.5	0.5
Territorial highways	12.0	3.0
Control of outdoor advertising	30.0	0.0
Safer-Off system roads	200.0	0.0
Access highways to lakes	15.0	0.0
Total	9,299.5	8,962.1

a. 4R = resurfacing, restoration, rehabilitation, and reconstruction.

b. Grants made by the NHTSA. Also includes $20 million for enforcement of maximum speed limit.

c. 50 percent trust fund, 50 percent general fund.

d. $25 million in direct spending from the trust fund and $10 million for appropriation from the general revenues.

e. 67 percent trust fund, 33 percent general fund.

f. Part derived from timber sales.

g. Part derived from grazing fees.

eligible for federal aid, but broad latitude was given to the states in selecting which routes to include. In contrast, the federal government more actively plans and controls the Interstate program, which it designed as a planned system of national routes. It provided the funds to build those routes on unusually attractive terms. Unlike the other federal-aid systems, which had received 50 percent federal support, the Interstate routes were eligible for 90 percent federal financing. The strong, centralized federal control of the Interstate system and the exceptionally strong federal financial support for it reflected the national interest in this road system, which today provides the principal intercity highway linkage between the nation's major cities, industrial areas, ports, defense installations, and recreational areas.

But as the federal government tightly focused its interest in intercity highways through the Interstate program, its role in other highway activities became more dispersed and varied. Since the late 1960s, the scope of these other highway programs has continually expanded, chiefly through the addition of safety and other relatively specialized programs. The number of separate authorizations increased dramatically from 8 in 1956 to 38 by 1974. 3/

In addition, the federal government has assumed more of the cost of the projects in which it is involved, even though the federal share of overall highway spending has remained roughly constant during the last two decades. The federal matching ratio for non-Interstate projects was increased from the 50 percent that had prevailed since 1916 to 70 percent in 1974 and to 75 percent for most programs in 1978. These increases in the share of project financing borne by the federal government actually represent a decline in the leverage of the federal government in all highway programs, because the federal share of total spending has not increased correspondingly.

Typically, states arrange their construction schedules by setting out their planned projects; match these with available federal funds to ensure that all such financing is used; and then go on to build the remaining projects themselves, budgets permitting. The result is that, for all of the major Federal-Aid systems except the Interstate system, federal funds have increasingly become akin to revenue sharing: federally collected revenues are transferred to states with relatively little federal influence on project selection.

In brief, the federal highway program has shown two general trends during recent years. First, many small, specialized categorical programs have been added to address specific Congressional concerns. Second, the major non-Interstate highway programs--involving the Primary, Secondary,

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3. Ibid. For 1974 there were also 17 separate authorizations from the general fund.

and Urban systems--are financed by a kind of revenue sharing, in which state financial conditions and program priorities dominate investment decisions.

CURRENT HIGHWAY PROBLEMS

As the federal highway program has changed over the years in response to state needs and Congressional concerns, spending levels have not been maintained at levels adequate to prevent deterioration of the road systems. This problem will become even more severe in the years ahead unless spending--either state or federal--is increased.

While there is significant physical deterioration on almost every part of the highway network, the Interstate system provides a new and particularly troublesome concern. Many Interstate roads are reaching the end of their planned life cycle for the first time, so that greatly increased repair funds will be needed to maintain them. A similar life cycle crisis for bridges in the Federal-Aid system is expected during the 1980s and 1990s. It has already arrived for many bridges in state and local systems, over 30 percent of which are classed as structurally deficient.

These repair needs arise at a time when substantial funds are required to complete the remaining unbuilt portions of the Interstate system. As originally conceived, the system would have been completed well before the first cycle of major repairs was due. Construction was delayed by general cost increases and changes in the scope of the system, so that new construction has increasingly come to compete with repairs for the available funding. Although only part of the remaining 1,500 miles of unbuilt routes are vital to an interconnected national network, the system as currently defined will require larger authorizations if it is to be completed by 1990.

The financial pinch has been considerably worsened by inflation and rising energy prices. On one hand, highway construction costs have risen even faster than the cost of living in recent years. On the other, rising fuel prices have slowed the growth in vehicle travel while stimulating improvements in vehicular fuel efficiency. As a result, revenues from motor fuels taxes have leveled off at a time when the costs of highway construction and repair required rapidly increasing funds. 4/ These financial pressures have forced not only the federal government but many states to defer highway repairs. Even though almost half the states have raised their taxes on motor fuel in the past two years, this has not been enough to make up for

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4. The trend of the 1970s represents a change from the 1960s when receipts grew at an annual rate of about 8 percent, exceeding highway cost inflation. It should be noted that in the past two years highway construction costs have declined, in large part because of excess capacity in the construction industry.

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purchasing power lost to inflation in earlier years. (Appendix C shows current state motor fuel taxes.)

The need for three main categories of repairs--Interstate repairs, non-Interstate road repairs, and bridge replacement--is summarized in the following three sections, followed by a discussion of the financing required to complete the Interstate Highway System. The chapter concludes with a summary of the cost estimates.

Any discussion of needs must be approached with caution since estimates of needs often reflect the expectations of particular groups or agencies. The following sections, however, attempt to use well-defined concepts of needs in making these estimates.

Interstate Repairs

The typical Interstate highway is designed to last for 20 years before requiring major rehabilitation work. Since construction on the Interstate system began in 1956, over 41 percent of the system has already reached this milestone, 5/ and 75 percent of the system should reach it by 1990. The Federal Highway Administration reports that 6 to 7 percent of Interstate mileage was in poor condition in 1978, up from 4 percent in 1975. 6/ This represents a significant change from earlier years when most parts of the Interstate were so new that virtually none of it was in poor shape. Funds for Interstate repair must now be added to construction needs.

Keeping roads in good repair is crucial because the overall cost of using the roads increases substantially as road conditions become worse. Vehicle maintenance costs increase as roads become rougher, travel times lengthen at lower speeds, and travel distances grow as drivers try to avoid particularly bad stretches of road. Accidents, too, may increase. One study found that operating costs on a road in poor condition may be 20 to 36 percent higher than on a road in good condition (see Table 3). In addition, the condition of a road deteriorates at an increasing rate if needed repairs are not made. As a result, the long-run cost to the government could

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5. Congressional Budget Office, The Interstate Highway System: Issues and Options (June 1982), p. 6.

6. Federal Highway Administration, The Status of the Nation's Highways: Conditions and Performance (January 1981). The bad roads are concentrated in a few states; only five (Arizona, Minnesota, North Carolina, Ohio, and Oregon) were reported to have more than 10 percent of their Interstate in poor condition and about half the states were reported to have less than 2 percent. Informal comments from FHWA indicate that measurement problems may have overstated the fraction of poor miles reported in 1978.

TABLE 3. INCREASES IN OPERATING COSTS FOR SELECTED VEHICLES AS ROAD CONDITIONS DETERIORATE (In percent) a/

Condition b/	Small Auto	Small Single-Unit Truck c/	Large Combination Truck d/
Good	0	0	0
Fair	9	5	8
Poor	35	21	36

SOURCE: Federal Highway Administration, Office of Highway Planning, Vehicle Operating Costs, Fuel Consumption, and Pavement Type and Condition Factors, Final Report (June 1982), Appendix A.

a. Operating costs include fuel, oil, vehicle maintenance and repair, and depreciation, but exclude labor costs. Cost changes assume 55 miles per hour and no grades.

b. In this illustration, a pavement serviceability rating of 4.0 is used to represent a typical good road; 3.0 a road in fair condition; and 1.5 a road in poor condition.

c. A two-axle vehicle.

d. A five-axle semitrailer.

increase if repairs are not made in a timely fashion. Eliminating all sections of poor road from the Interstate highways and keeping the system in repair would cost an estimated $3.2 billion a year throughout the rest of the 1980s. (At a 90 percent federal match, federal costs would average $2.9 billion.)

In addition to repairs, planned reconstruction projects would cost $4.4 billion per year. Most projects classified as reconstruction are strictly of state or local importance, and this costly category of work appears to be of substantially lower federal priority than repairing and completing the system. For example, a little over half of all reconstruction projects are

less essential projects that were dropped from the official definition of the Interstate system last year. The remainder represent additional projects that are important to the states (widening and adding interchanges, for example) but that are only secondarily related to the provision of a national, interconnected road network. Nevertheless, the federal program has allotted some resources for them partly as a workable mechanism for scaling back the dimensions--and costs--of a functioning Interstate system (see footnote 9). If the federal government financed a quarter of these locally important projects, $1.1 billion a year would be needed.

Non-Interstate Roads

Other parts of the Federal-Aid highway system--the Primary, Secondary, and Urban systems--also face problems of deferred repair, though not quite as severe as does the Interstate. The Federal Highway Administration reports that in 1978 about 6 percent of Primary routes were in poor condition, about 9 percent of the Secondary system, and 7 percent of the Urban system (see Table 4). In contrast to the Interstate system, however, these fractions were generally slightly better than in earlier years.

Even though the fraction of Primary, Secondary, and Urban routes in poor condition has not increased recently, the fraction of these systems in only fair condition is significantly higher than for the Interstate and portends a major emerging problem. Over 50 percent of the Primary, Secondary, and Urban systems were in only fair condition in 1978, about 10 percentage points more than in 1972. This suggests that the proportion of roads in poor condition is likely to increase rapidly unless more remedial work is done. While the condition of roads not included in the Federal-Aid system is less certain, it appears to be similar to or worse than that of Secondary and Urban systems.

Over the next 15 years, the total costs of preventing further deterioration in the Primary, Secondary, and Urban systems are estimated at $53 billion, $60 billion, and $42 billion, respectively. 7/ These sums include the cost of adding some road capacity in line with expected growth in traffic. If federal support for these programs continues in the same proportion to total spending as in the past, annual outlays over the next four years will be $2.9 billion, $1.0 billion, and $0.7 billion for the Primary, Secondary, and Urban sytems, respectively. (This assumes that the federal government would continue to pay about 20 percent of total capital

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7. Estimates from Federal Highway Administration, The Status of the Nation's Highways: Conditions and Performance (January 1981), adjusted for inflation.

TABLE 4. PAVEMENT CONDITIONS ON THE FEDERAL-AID HIGHWAY SYSTEM IN 1978

Federal-Aid System	Condition of Road (percent)		Change From 1975 (percentage points)		Change From 1972 (percentage points)	
	Poor	Fair	Poor	Fair	Poor	Fair
Interstate						
Rural	7 a/	30	+3	+8	+7 b/	N/A
Urban	6 a/	36	+3	+7	+6 b/	N/A
Primary c/						
Rural	6	52	-1	+6	-2	+8
Urban	6	53	0	+7	0	+12
Secondary d/	9	66	-1	+6	0	+8
Urban e/	8	59	-1	+4	-1	+11

NOTE: N/A = Not available.

SOURCE: Federal Highway Administration, The Status of the Nation's Highways: Conditions and Performance (January 1981), pp. 74-75.

a. The FHWA report used as the source for this table showed 9 percent of the rural Interstate in poor condition and 8 percent of the urban Interstate. The FHWA has revised these estimates downward as a result of recently discovered data errors.

b. Estimate by CBO.

c. Data for arterial roads.

d. Data for rural collector roads.

e. Data for urban collector roads.

spending for the Secondary and Urban roads, and about 70 percent of the total for the Primary system.)

Bridge Replacement

Bridges are typically expected to last for about 50 years before requiring major reconstruction work or replacement. Fully 30 percent of all Federal-Aid bridges were built before 1940, and 43 percent of other bridges are even older.

Replacing or rehabilitating all the nation's deficient bridges would cost about $47.6 billion (in 1981 dollars). 8/ About half of this ($24.6 billion) would be for bridges on the Federal-Aid system, including $1.7 billion for Interstate bridges and $9.9 billion for bridges on the Primary system. The costs for the first four years of a 15-year program to replace or rehabilitate these bridges would be about $1.9 billion a year. If the federal government continued to finance about 70 percent of bridge costs on the Federal-Aid system, $1.3 billion would be required as the federal share.

The Federal Highway Administration has characterized 22.7 percent of the nation's 574,000 bridges as structurally deficient--roughly 10 percent of the bridges on the Federal-Aid system and one third of other bridges. While most of these structurally deficient bridges are still safe for light vehicles, it is sometimes necessary to reroute large trucks. Only 21.6 percent of the structurally deficient bridges are on the Federal-Aid system, but these tend to be the largest, most expensive ones. In addition to bridges with major structural problems, another 21.9 percent of all bridges are functionally obsolete--that is, they do not meet current FHWA design standards or have inadequate capacity for existing traffic volumes.

Interstate Completion

Parts of the Interstate Highway System--less than 5 percent--remain uncompleted. The Congress has set a target date of 1990 for completion of the remaining 1,575 miles. As currently defined, completion of the system, which has come to include upgrading parts that are already open to traffic, will cost the federal government a total of $32.6 billion (in 1982

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8. Federal Highway Administration, Highway Bridge Replacement and Rehabilitation Program, Third Annual Report to the Congress (March 1982).

dollars). 9/ This high cost is a reflection of several factors: inflation; the location of many of the remaining routes in urban areas; and the inclusion of environmental or safety work that was not originally conceived as part of the Interstate system. The current authorizations of $3.1 billion a year would need to be increased by $2.0 billion to complete the system as scheduled. Otherwise, the 1990 deadline can only be met by substantially reducing the amount of construction. 10/ As a functioning, interconnected national system, however, the Interstate is virtually complete. If gaps of largely local significance that have not been approved for construction were excluded, only $2.2 billion a year would be needed to complete the system. This sum could be reduced to $1.1 billion if local gaps that have been approved but not yet placed under construction were excluded as well.

Summary of Estimates of Highway Costs

Over the next four years, the expenditures necessary for the Federal-Aid system would total $27.7 billion a year, with the estimated federal share being $15 billion annually and the state share almost $13 billion. The greatest federal expenditures would be for Interstate completion, Primary system repair, Interstate repair, and bridge repair (see Table 5). The division of costs between federal, state, and local governments is assumed to remain fixed. Thus, while $15 billion represents about a 70 percent increase in federal highway spending, a similar 70 percent increase in spending by state and local governments is assumed as well.

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9. The direct costs of completing the Interstate system depend on the degree to which local governments take advantage of Interstate transfers. Under this provision, local governments, with the approval of their state, may decide not to build particular Interstate segments. If the Federal Highway Administration rules that the segment is not required for a national, interconnected highway system, the locality can "trade" this authorization for capital investments in other highways or in mass transit. Unlike most highway programs, these funds must be appropriated, since outlays for highway and non-highway substitute projects are paid from general revenues, not the Highway Trust Fund. While greatly increased use of this provision would not change total federal highway costs, it would reduce the direct costs of completing the Interstate. The cost estimates used in this paper assume that a total of $2.5 billion of Interstate segments will be withdrawn in the future.

10. For a full analysis of the issues involved in completing the Interstate System, see Congressional Budget Office, The Interstate Highway System.

TABLE 5. ESTIMATE OF MAJOR NATIONAL HIGHWAY NEEDS AND THE FEDERAL SHARE, 1983-1986

Area of Need	Average Annual Authorizations 1983-1986 (billions of dollars) a/ Total Estimated Needs	Federal Share of Estimated Needs	State and Local Share of Estimated Needs	Effective Federal Share (percent) b/
Completion of Interstate System by 1990	5.7	5.1 c/	0.6	90
Interstate Repair	3.2	2.9 c/	0.3	90
Interstate Reconstruction	4.4	1.1 c/	3.3	25 d/
Primary	4.1	2.9 e/	1.2	70
Bridge Repair	1.9	1.3 f/	0.6	70
Secondary	5.2	1.0 e/	4.2	20
Urban	3.2	0.7 e/	2.5	20
Total g/	27.7	15.0	12.7	54

a. The estimates are for a four-year federal highway program for 1983-1986. After 1986, authorizations would have to be increased to adjust for inflation.

b. Department of Transportation, Final Report on the Federal Highway Cost Allocation Study (May 1982), p. IV-14. These represent federal shares of highway spending after accounting for state-only projects.

c. Congressional Budget Office, The Interstate Highway System: Issues and Options (June 1982).

(Continued)

TABLE 5. (Footnotes Continued)

d. Congressional Budget Office assumption.

e. Federal Highway Administration, The Status of the Nation's Highways: Conditions and Performance (January 1981), Table 5-1, p. 154 with adjustments to reflect inflation and the effective federal share as shown in the fourth column. Assumes a 15-year program with future adjustments for inflation.

f. Federal Highway Administration, Highway Bridge Replacement and Rehabilitation Program, Third Annual Report to the Congress (March 1982). Assumes a 15-year program with future adjustments for inflation, and is restricted to the Federal-Aid system.

g. Excludes Interstate transfer grants for highways, safety grants, recreational roads, and roads off the Federal-Aid system.

CHAPTER III. THE HIGHWAY TRUST FUND

The creation of the Highway Trust Fund in 1956 established a separate account whereby payments from road users were set aside and reserved for federal highway programs. 1/ This approach kept the cost of roadbuilding from burdening other taxpayers, ensured that the taxes paid by road users would be sent back to them in the form of better roads, and permitted an unprecedentedly large highway program--the Interstate system--to begin and proceed uninterrupted.

FUND REVENUES

The Highway Trust Fund is simple in concept: road users pay into the fund in some rough proportion to their use, and expenditures are made from the fund to support federal highway programs. Users pay through separate taxes on gasoline, diesel fuel, special motor fuels, tires, tubes, tread rubber, new trucks, truck parts, lubricating oil, and heavy vehicles (see Table 6). The receipts from these taxes are placed in the Highway Trust Fund as they are collected, and subsequently withdrawn to pay for eligible construction or repair projects.

Under most federal highway programs financed from the trust fund, the federal government pays some fixed proportion of a project's cost, the rest being paid by the state concerned. For Interstate projects, the federal government pays 90 percent of the cost, while for most other federal projects it pays 75 percent. Most states finance their share of the cost through their own road user taxes, which are often paid into state trust funds dedicated to road programs. Indeed, almost every state has such dedicated funds, and in 1982 the average state tax on gasoline was ten cents per gallon--two and a half times the federal tax of four cents per gallon (see Appendix C). Similarly, state spending on roads in 1982 was almost twice the level of federal spending.

Although the federal share of cooperative federal/state highway projects is about 75 percent, the states nonetheless carry the major burden of highway expenditures because they support many roads and projects that are not eligible for federal aid, and because they also finance day-to-day operations such as grass mowing and snow removal that receive no federal support.

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1. For more details, see Congressional Budget Office, Highway Assistance Programs: A Historical Perspective (February 1978).

TABLE 6. CURRENT HIGHWAY EXCISE TAX RATES

Tax	Current Rate a/
Motor Fuels	
Gasoline	4 cents per gallon
Diesel	4 cents per gallon
Special motor fuels	4 cents per gallon
Rubber	
Tires	10 cents per pound
Tubes	10 cents per pound
Retreads	5 cents per pound
New Trucks and Trailers (Over 10,000 pounds gross weight)	10 percent of manufacturer's wholesale price
Annual Heavy-Vehicle Use Tax	$3 per 1,000 pounds when gross weight exceeds 26,000 pounds
Truck Parts and Accessories	8 percent of manufacturer's wholesale price
Lubrication Oil (For highway use)	6 cents per gallon

NOTE: In addition, several groups of highway users are exempted from paying certain taxes. These include most state and local governments, most users of buses, and producers of gasohol. (See Table A-3 in Appendix A.)

a. In most cases, these are temporary rates that would drop to lower, permanent rates if the Highway Trust Fund was abolished.

REVENUE PROJECTIONS

In 1982, federal highway user taxes will raise about $6.6 billion, of which more than two-thirds will come from taxes on motor fuel (see Table 7). In addition, the Trust Fund will earn about $1.1 billion in interest because it has a substantial cash balance--projected to be about $9.0 billion at the end of fiscal year 1982. (This balance does not represent a surplus, however, since it will be more than offset by the cost of ongoing projects and other existing liabilities as these draw on the fund in future years. These existing liabilities total about $19.3 billion, leaving the fund with about $10.3 billion in unfunded liabilities. This is discussed further in Chapter V.)

When interest is included, the total receipts to the trust fund will be around $7.7 billion in 1982. This is only $100 million more than total receipts five years ago.

Sources of Revenue

The most important sources of trust fund revenues are the tax on motor fuel (gasoline and diesel), interest on the cash balance, excise taxes on new truck sales and on truck parts, and the heavy vehicle use tax. The Treasury Department has projected the net receipts of each of these taxes. The projections are discussed briefly below, and will be used in the next chapter.

Motor Fuel Taxes. Receipts from the four-cents-per-gallon tax on motor fuels are estimated at $4.6 billion for 1982 and account for 68 percent of tax revenues, exclusive of interest. These receipts dropped by about 10 percent or $400 million in 1980, in response to large price increases in fuel during the Iranian crisis. Higher prices and difficulty in obtaining fuel encouraged people to economize by driving less. Receipts should show little change in the foreseeable future and are expected to average about $4.4 billion annually despite continued growth in vehicle miles travelled. Growth in diesel consumption by both trucks and cars is expected to offset the decline in gasoline use as more fuel-efficient cars continue to replace older vehicles.

Interest. The second largest source of revenues, about $1.1 billion, is the interest on the cash balance in the trust fund. If current policies continue, interest receipts will diminish as the cash balance declines and as interest rates recede from their current high levels.

Excise Taxes. Next in importance is the 10 percent excise tax on new truck sales. This tax is quite volatile, reflecting inflation, general economic conditions, and the level of truck sales. This and the 8 percent tax on truck parts are the only highway taxes that respond to inflation. Although depressed in 1981 because of the extremely low level of truck sales, resumption of economic growth will probably make these receipts increase

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TABLE 7. RECENT TRENDS IN FEDERAL HIGHWAY EXCISE TAX RECEIPTS, 1978-1982 (In millions of dollars)

Tax	1978	1979	1980	1981	1982 Estimate a/
Gasoline (Net)	4,237	4,337	3,898	3,758 b/	3,969
Diesel	484	497	523	561	597
Total Motor Fuel Taxes	4,722	4,834	4,421	4,319	4,566
Truck Sales	851	944	912	664	771
Truck Parts	188	225	253	234	231
Heavy Vehicle Use Tax	246	235	277	237	289
Tires, Tubes, and Tread Rubber	818	867	680	644	667
Lubricating Oil (Net)	80	84	77	76	80
Total Excise Taxes	6,905	7,189	6,620	6,174	6,604
Interest on Cash Balance	662	857	1,027	1,129	1,079
Total Highway Trust Fund	7,567	8,046	7,647	7,303	7,683

a. Estimate by Department of the Treasury.

b. Excludes $131 million transferred from an escrow account for the Virgin Islands and Puerto Rico.

more rapidly over the next few years--over 10 percent a year for the tax on new truck sales and 6 percent a year for the tax on parts.

Heavy Vehicle Use Taxes. The heavy vehicle use tax is paid only by vehicles over 26,000 pounds gross weight. The tax rate, $3 per 1,000 pounds or $240 per year for vehicles at the 80,000 pound federal limit, has not been adjusted for inflation but remains at the rate set in 1961. Receipts from this tax will grow slowly--about 1 percent per year--reflecting slow growth in the fleet of heavy trucks. The other highway taxes, those on tires, tubes, tread rubber, and lubricating oil, will also grow very slowly in future years because improvements in tires and oil have reduced consumption relative to travel. These tax rates have also not been increased for over 20 years.

Growth in Future Years

Together, the projections sketched above indicate that the growth of receipts in future years will be slight. The Treasury Department projects net receipts (in nominal dollars) from federal highway excise taxes as growing about 2 percent a year from 1980 through 1987 (see Table 8). 2/ After including the effect of lower interest payments, total Highway Trust Fund receipts will grow by only about 1.3 percent a year. Even if highway inflation averages only 7 percent a year over the next five years, this means that the real purchasing power of the Highway Trust Fund will decline by more than 5 percent a year. Thus, the lag between needs and resources promises to increase unless some action is taken either to increase highway revenues or to restrict federal support to a smaller set of highways.

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2. A comparison with 1980 is used since receipts in both 1981 and 1982 were affected by economic conditions in general and very low truck sales in particular.

TABLE 8. FORECAST OF HIGHWAY TRUST FUND TAX RECEIPTS, 1980-1987 (In millions of dollars)

Tax	1980	1983	1984	1985	1986	1987	Annual Growth Rate 1980-1987 a/
Gasoline (Net)	3,898	3,823	3,762	3,713	3,647	3,669	(0.9)
Diesel	523	608	645	681	719	758	5.4
Total Motor Fuel Taxes	4,421	4,431	4,407	4,394	4,366	4,427	0.0
Truck Sales	912	1,055	1,395	1,487	1,684	1,795	10.2
Truck Parts	253	277	301	322	344	367	5.5
Heavy Vehicle Use Tax	277	268	273	278	282	286	0.5
Tires, Tubes, and Tread Rubber	680	670	673	680	682	698	0.4
Lubricating Oil (Net)	77	80	80	80	80	80	0.5
Total Excise Taxes	6,620	6,781	7,129	7,241	7,438	7,653	2.1
Interest on Cash Balance b/	1,027	1,040	950	880	780	740	(4.6)
Total Highway Trust Fund	7,647	7,821	8,079	8,121	8,218	8,393	1.3

SOURCE: Office of Tax Analysis, Office of the Secretary of the Treasury, July 19, 1982.

a. Fiscal year 1980 is used as a base since the recession has distorted receipts for 1981 and 1982, particularly in truck sales.

b. Estimate by Congressional Budget Office assuming no change in the cash balance in the fund and using CBO's forecast of interest rates.

CHAPTER IV. THREE APPROACHES TO HIGHWAY POLICY

The resources of the Highway Trust Fund are inadequate to keep the Federal-Aid highways in repair and to complete the Interstate Highway System. This financial discrepancy will grow in future years if current policies continue. The impasse could be resolved in two ways: by devoting more funds to federal highway programs so that repairs could be made as needed; or by targeting available funds on those parts of the highway program most crucial to the federal interest, with other activities being turned back to the regions, states, or localities involved. This chapter examines each of these approaches in comparison with a continuation of current spending patterns. The two alternatives are:

- Increased program levels, corresponding to the proposal (H. R. 6211) reported by the House Public Works and Transportation Committee in 1982; and

- Targeting of federal support exclusively on the Interstate and Primary systems.

The next three sections examine the outlook for highway spending under the current level of funding and under each of the two alternatives. The consequences of the three strategies are appraised in Chapter V. For each option, it is assumed that, along with the cash balance in the trust fund, highway user taxes would be increased sufficiently to cover program costs over the next four years. In particular, the current spending option is assumed to continue until 1987 without a tax increase, even though this could not be sustained indefinitely because the cash balance in the trust fund would eventually be exhausted. The increased program option is assumed to be financed by a tax increase equivalent to an increase of four cents per gallon in the tax on motor fuels, as was proposed in H. R. 6211 and has been proposed most recently by the Administration. The redirected federal role option is assumed to be financed by current highway user taxes, although alternative financing approaches for this option are also addressed.

CONTINUATION OF CURRENT SPENDING

Assuming the level of authorizations proposed by the Senate Committee on Environment and Public Works bill (S. 2574), the federal highway program could continue until 1987 without increasing road-user taxes, although such an approach would draw down a large part of the cash balance in the Highway Trust Fund. Authorizations are assumed to start at $8.7 billion in 1983 and increase to $10.3 billion in 1986. For comparison, authorizations from the Highway Trust Fund totalled about $8.6 billion in 1982.

Funds for repair and reconstruction of the Interstate program would climb from $800 million in 1982 to $1.1 billion in 1983. There would be a small increase in authorizations for Interstate construction from $3.1 billion in 1982 to $3.3 billion in 1983 and $3.5 billion in 1986. Other funding changes would be relatively modest, with an increase in the bridge program and a decrease for the Urban system. More important, the Senate bill would reduce the federal matching share of Secondary and Urban roads from 75 percent to 50 percent, the level that prevailed from 1920 to 1974. About 20 smaller programs, many of them authorized from general revenues, would be eliminated entirely. 1/

INCREASED PROGRAM LEVELS

Increased program levels such as those embodied in H. R. 6211 would move spending substantially above current policy. Overall, this option would increase current spending from the trust fund by over 50 percent, financing it through an increase in highway user fees of $4.4 billion a year--equal to four cents per gallon of motor fuel. 2/ Authorizations from the Highway Trust Fund would start at $12.7 billion in 1983, and increase to $14.5 billion by 1986.

The largest increase, from $800 million in 1982 to $2.1 billion in 1983, would be for repair and reconstruction of the Interstate system. Authorization for construction of new routes needed to complete the Interstate system would be increased from $3.1 billion in 1982 to $4.0 billion in 1983. Even so, this would not suffice to complete the system, as currently planned, by the 1990 deadline. 3/ Significant increases are also included for the Primary system (from $1.5 billion in 1982 to $2.0 billion in 1983) and the bridge program ($0.9 billion to $1.5 billion). The Secondary program would receive a smaller increase, while the Urban system would be held at its current $800 million level.

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1. This option is based on specific legislation proposed by the Senate Committee on Environment and Public Works, and is not identical with CBO's definition of current policy, which adjusts the most recent level of spending for predicted levels of inflation.

2. The House bill would also raise an additional $1.1 billion per year to finance mass transit capital grants. This additional increase--equivalent to a further increase of one cent per gallon in the tax on motor fuels--would represent a major change from past uses of highway user fees.

3. Completion by 1990 would be possible only if inflation was lower than projected by CBO, if states voluntarily withdrew more of the Interstate system for transit or other highway projects than assumed by CBO, and if certain other technical assumptions proved incorrect.

REDIRECTED FEDERAL ROLE

Instead of increasing funding to meet needs, as these are implied by current federal/state divisions of financial responsibility, the Congress may wish to consider a major change in the federal highway role in comparison to that of state and local governments. While federal, state, and local highway interests frequently overlap, highway programs vary in the extent to which they involve the national interest (see Table 9). Present Federal-Aid programs can be grouped into three broad categories:

- o Major intercity roads;
- o Other roads; and
- o Safety and other programs.

The national interest is predominantly reflected in the first category of programs--roads that link activities in different states and contribute to interstate commerce. The federal programs in this category are the Interstate system, the Primary system, and related parts of the bridge program. While some routes on the Primary system are not major intercity arteries, most Primary routes are significant intercity arteries: in rural areas they carry twice as much interstate traffic as does the Interstate system. For simplicity, all Primary routes are assumed to be maintained as a federal priority under the redirected federal role option.

The second group of programs includes the rest of the Federal-Aid system and some aid for roads not on the system. Federal spending accounts for only about 20 percent of total government capital spending on the Secondary and Urban systems. Although projects on these systems that are eligible for federal funds may receive at least a 75 percent federal match, the states build many projects using 100 percent state funds. Because states carry the bulk of the burden for these systems, federal aid has relatively little influence on the total amounts spent. Further, the Secondary and Urban systems are not restrictively defined. The Secondary, for example, includes 93 percent of all major rural roads in the country. In effect, these programs have many of the characteristics of revenue sharing. Rather than continue its modest role in financing these systems, the federal government might more effectively focus its resources on the Interstate and Primary systems where there is the clearest national interest, and where its financing now plays a dominant role.

The final group of programs represent a mix of safety, economic development, and special regional interests. While all levels of government share concern for safe highways, a more effective selection of projects could be made by state and local governments. Most of the non-safety programs in this category represent site-specific or special-purpose programs that do not fit well in a general realignment of highway programs such as that discussed here. In any case, the need for federal support is

TABLE 9. BASIC TYPES OF FEDERAL HIGHWAY PROGRAMS FINANCED BY THE HIGHWAY TRUST FUND

Program	Fiscal Year 1982 Authorizations (thousands of dollars)
Programs that Provide for Intercity Transport	
Interstate construction	3,225
Interstate repairs	800
Primary system	1,500
Part of bridge construction and reconstruction applied to Primary routes a/	400
Subtotal, intercity arteries	5,925
Other Roads	
Secondary system	400
Urban system	800
Part of bridge replacement and reconstruction applied to non-Primary routes	500
Subtotal, revenue sharing	1,700
Safety and Other Specialized Programs	
Rail-highway crossings	240
Pavement marking and hazard removal	265
Categorical safety programs	159
Emergency relief	100
Economic growth centers	50
Forest and other recreational roads	84
Interstate transfer grants for highways	113
Subtotal, other programs	1,011
Total	8,636 b/

a. Estimate based on proportion of fiscal years 1979-1981 Bridge Construction and Reconstruction Program funds that were obligated to bridges on the Interstate and Primary systems.

b. In addition, about $1 billion was authorized for highways from general funds.

certainly less compelling than it is for roads that interconnect the states and that carry significant components of intercity travel. In particular, the Interstate and Primary routes comprise only 8 percent of the nation's roads, but carry almost half the nation's traffic.

If existing federal highway resources were concentrated exclusively on these roads of greatest national importance, an immediate federal tax increase could be avoided while the funds provided would be adequate. By 1986, however, a tax increase would probably be required in order to ensure that the Highway Trust Fund would be able to meet its short-term obligations.

The redirected federal role option presented here would drop all but the Interstate and Primary systems and their related bridge projects (see Table 10). For these, the federal authorization levels would be increased significantly to meet estimated needs.

Ending federal participation in these non-national road systems--including Urban and Secondary (rural) roads, a large number of smaller grant programs, and local routes on the Interstate--would reduce federal expenditures for these roads by about $2.6 billion from the Highway Trust Fund and, in effect, reprogram these funds to meet the repair needs of the Interstate and Primary roads. The Administration's proposed New Federalism, while similar in concept, calls for a less dramatic reallocation of resources toward repair than shown in Table 10, and would have smaller authorizations. The Administration's approach would, however, turn part of the funds saved by program curtailments back to the states. This would make the transition more workable at the state level. If funds were not turned back to the states, the sudden end of federal assistance for Urban and Secondary routes would place strong financial pressures on many states until they were able to enact new user fees and programs of their own.

SUMMARY OF THE THREE PROGRAM OPTIONS

The average authorization levels over the next four years for these highway program options would range from $9.6 billion a year for the continuation of current spending to $10.5 billion for the redirected federal role option and $13.5 billion annually for the increased program option (see Table 11). These estimates are not fully comparable, since a redirected federal role implies a significant increase in state highway responsibilities and the resulting financial burden is not reflected in these federal totals. For those programs that it would fund--basically the Interstate and Primary systems--this option contains the largest level of authorization.

TABLE 10. FEDERAL HIGHWAY PROGRAM UNDER A REDIRECTED FEDERAL ROLE (In billions of current dollars)

Program	Federal Share of Needs (percent) a/	Average Annual Authorization 1983-1986	1982 Authorization
Completion of Interstate System by 1990	90	2.2 b/	3.2
Interstate Repair	90	2.9 c/	0.8
Interstate Reconstruction	25 d/	1.9 b/	
Primary	70	2.9 c/	1.5
Bridge Repair	70	0.6 e/	0.9
Secondary	0 d/	0	0.4
Urban	0 d/	0	0.8
Other	0 d/	0	1.0
Total		10.5	8.6

a. Department of Transportation, Final Report on the Federal Highway Cost Allocation Study (May 1982), p. IV-14.

b. Minimum Interstate construction option from Congressional Budget Office, The Interstate Highway System: Issues and Options (June 1982).

c. See Table 8.

d. Congressional Budget Office.

e. Includes only Interstate and Primary share of bridge program.

TABLE 11. COMPARISON OF MAJOR HIGHWAY OPTIONS

Area of Need	Average Annual Authorizations 1983-1986 (billions of dollars) Increased Spending Option	Current Spending Option	Redirected Federal Role a/
Completion of Interstate System by 1990	4.0	3.4	2.2
Interstate Repair	2.6	1.6	2.9
Interstate Reconstruction			1.9
Primary	2.2	1.6	2.9
Bridge Repair	1.7	1.2	0.6 b/
Secondary	0.6	0.5	0.0
Urban	0.8	0.7	0.0
Other c/	1.5	0.7	0.0
Total	13.5	9.6	10.5

NOTE: Totals may not add because of rounding.

a. Assumes turnback to states of all non-Interstate and non-Primary roads and non-Primary bridges.

b. For bridges on the Primary and Interstate systems only.

c. Interstate transfer grants, safety programs, development highways, etc.

CHAPTER V. EVALUATION OF THE OPTIONS

The three general approaches to highway policy outlined in the previous chapter would have substantially different implications in terms of long-run economic efficiency, the physical condition of the nation's roads, the federal budget, and state governments. To assess these differences, this chapter explores five questions:

- How well does each approach contribute to the most economically efficient transportation infrastructure?
- How well does each address the physical condition of the highways?
- What are the likely impacts on state and local governments?
- How much would highway user taxes increase, and what would be the effects of that increase?
- What would be the impact on the federal deficit?

CONTRIBUTION TO ECONOMIC EFFICIENCY

The most important reason for concern with the condition of the nation's roads is that they are vital to long-run economic efficiency. To the extent that key national routes are in poor condition, the costs of commerce will be higher; and as some economic activities are discouraged or become more expensive, the overall output of goods and services will be reduced. But conversely, overinvestment in federal highways would divert resources from private investment and impose an unnecessary burden on the economy. The question is what highway program would best support the private economy, regional needs, and defense requirements. The answer to this question can be framed in terms of: (1) the magnitude of the investment, (2) how the investment is allocated among different areas of highway need, and (3) who pays for it. These issues are judgmental; but to the extent that economic efficiency is the goal, a clear operating principle emerges--that users should pay the full cost of the highway services provided them.

In the aggregate, users would eventually pay the full cost of all the highway options considered here. However, the options are not equal in the way they distribute these costs across time. This is because a continuation of the current spending pattern would defer addressing the problem of highway repair. As roads continued to deteriorate and repair costs rose

markedly, this option could impose costs on future highway users that would be considered uneconomic and unfair.

There is an important corollary to this full-cost recovery principle: the share of cost paid by each class of user should be in proportion to the cost it imposes on the highway system. Under the current program, one class of users in effect subsidizes another. For example, heavy trucks pay less taxes in proportion to the wear they impose on the highway system, while light trucks pay more. If both paid in equal proportion, the result would be greater perceived fairness in highway taxes and a modest improvement in efficiency in the distribution of goods and services.

The increased spending option appears to offer the best prospect for correcting these inequities. The higher federal taxes it would require could be structured in a way that made payment proportional to cost imposed for each class of user. By contrast, the reduced federal role would leave much of the necessary adjustment to individual states. There is no assurance that the resulting distribution of cost recovery would either be uniform among the states or applied in the most economic manner.

Finally, decisions regarding highway investments that are not of strictly federal interest are best made by the jurisdictions closest to the problem--the states. If roads of local interest are not sufficiently attractive for states to invest in them, there is no economic reason why the federal government should influence this choice. Among the alternatives addressed here, the reduced federal role best matches decisionmaking with the level of government having the most information and interest in the decisions.

EFFECT ON THE PHYSICAL CONDITION OF THE HIGHWAYS

Highways do not wear out at a uniform rate. Pavements can deteriorate as much in their last several years of life as in the first 10 or 15 years. If repairs are postponed until too late in a road's life cycle, the long-term costs can greatly exceed any short-term savings. While this critical point is difficult to mark with precision, once a road declines to poor or fair condition, the costs of restoring it escalate rapidly. Thus a second criterion for evaluating the three approaches to highway policy is their effect on the physical condition of the nation's road network.

Current Spending Option

Current federal spending cannot adequately address highway problems unless state and local governments greatly increase their own highway spending. A significant real increase in state and local spending appears unlikely given the insensitivity of motor fuel taxes to inflation and the difficulties in raising these or other taxes. Further, as long as federal policy for highways remains unresolved--with programs and plans far beyond the

reach of federal funds--the states will probably not begin the major readjustments that would be required if current policy were to be continued into future years.

Increased Program

The increased program option would come close to putting dollars where the greatest problems are. While highway needs cannot be precisely gauged, spending of about $15 billion a year appears adequate to pay the federal share of repairs to the nation's highways and to complete the Interstate system. The option assumes annual authorizations of $13.5 billion over the next four years. While somewhat less than what appears to be needed, this approach substantially meets the federal share of the problem, particularly if authorization levels continue to be adjusted for inflation. It must be remembered, however, that it assumes a corresponding increase in state and local funding if real progress is to be made.

Nonetheless, the major increase in federal funds allotted to Interstate repair may still be inadequate since current law permits the use of some of it for construction work that has been dropped from the definition of the Interstate system. This new use will probably divert some portion of these funds away from repair work. For example, if states were to apply half of the Interstate repair funds to this new category, the balance would be enough for only 45 percent of repair needs on the Interstate system.

Redirected Federal Role

The redirected federal role option would perform quite well for those programs that would be retained by the federal government. It is the only option of the three discussed here that would permit completion of the Interstate by 1990 and provide adequate funds for repair of the Interstate and Primary systems. However, it would place the full burden for the Secondary and Urban roads on state and local governments. For them to meet these needs fully would require an average increase in their highway taxes equivalent to about 2.4 cents per gallon of motor fuel.

STATE AND LOCAL IMPACTS

Under all three program options, state and local governments would continue to face strong highway financing pressures. Each option assumes that state and local governments continue, and in some cases expand their current financial roles. Even under an increased federal program, state spending on the Federal-Aid system is assumed to increase by 50 percent. In addition, states face impressive demands to maintain roads and bridges that are not part of the Federal-Aid system. These demands exist even though most states have raised their highway taxes since the last increase in

federal highway user fees. (Appendix C shows the current fuel tax in each state and the most recent increase.)

Increased Program Option

The increased program level approach would offer the greatest aid to state highway departments since it would provide the most funding for Secondary and Urban roads. Since state and local governments already build some projects on these systems using only state funds, most states would be readily able to provide matching funds for their share of the increased program levels.

Redirected Federal Role

A reduced federal role would place a significant additional strain on state governments, since they would need to replace almost $2.6 billion in federal aid now spent for roads of lesser rank than the Primary system. Some states might decide not to replace all of these funds. This burden would not be offset by the increase in federal funding for Interstate and primary roads (roughly $4.5 billion a year), since state highway departments now spend little on these roads beyond that required to match federal spending. As a result, state governments would either have to make up entirely the $2.6 billion in diminished federal aid for Secondary and Urban routes, or else let the condition of these systems deteriorate. Because fewer federal financial regulations would apply to these projects when state-only funds were used, the states would probably achieve some savings through faster and less costly project completion. Also, as the condition of the Interstate and Primary systems improved, some traffic might be diverted from the Secondary and Urban routes. Even with these likely gains in efficiency, however, the states would face large additional financing needs if they were given full responsibility for Secondary and Urban roads without any corresponding increase in revenues.

The financial burden on state and local governments could be reduced substantially if additional tax resources were made available to them. As discussed in the next section, such a turnback could be provided through a temporary increase in the federal tax on motor fuel sufficient to generate $2.6 billion a year. As this tax was phased out, state and local governments could increase their highway fees in order to maintain their current level of spending.

IMPLICATIONS FOR HIGHWAY TAXES

Each of the three options discussed here is assumed to increase highway spending in future years. Because the receipts from current highway user taxes will grow very slowly throughout the 1980s, increased highway user

tax rates will be needed to support higher program levels. Unlike the 1960s and early 1970s, the 1980s will not have a trend of growth in vehicular travel and associated motor fuel tax receipts that automatically increases total highway revenues even with fixed tax rates.

The timing and size of the tax increases needed to support expansions in program levels can be set in many ways. Neither existing laws nor historical precedents constrain Congressional options. This flexibility arises because of the long delay--about two and one-half years, on average--between the time authorized funds become available to states and the time actual cash outlays are made from the Highway Trust Fund (Appendix B contains a fuller discussion). Because of this delay, the Trust Fund could maintain a positive cash balance even with increased liabilities. For example, at the end of 1982 the Fund had a cash balance of about $9.0 billion while its total liabilities (dollars that the states are authorized to spend) were $19.3 billion. This shortfall need not represent a problem because the revenues from highway taxes collected in future years can be used to pay these bills when they come due.

The Byrd Amendment, a provision of the law that set up the Highway Trust Fund, ensures that the Fund will always be able to pay its bills. This amendment requires that if projected revenues over the remaining life of the Trust Fund are not adequate to pay for the authorized highway program, the Treasury Department must withhold apportionments from the states until the program is brought into line with expected receipts. This procedure can force the Congress to choose between a temporary halt to highway authorizations or an increase in highway taxes. In fact, such a temporary halt occurred in fiscal year 1983 when, because the Highway Trust Fund had not been extended beyond 1984 as was expected earlier in the year, the Congress was forced to authorize only $5.1 billion for highway programs as against $8.6 billion in 1982. 1/

But the Byrd Amendment by itself is not sufficient to preclude financial difficulties with the Highway Trust Fund since the projections upon which it must rely may be inaccurate. If the projected costs and receipts proved to be incorrect, a financing crisis could result unless the cash balance in the fund was maintained at a sufficiently high level to cover errors in estimation. During three of the last ten years, the discrepancy between the predicted and actual cash balance has exceeded $2 billion, and once was over $3 billion. Such misestimates may occur for several reasons. First, economic forecasts may be overoptimistic so that revenues will be overestimated. Second, as a highway program switches toward more repair work, outlays tend to speed up relative to historical patterns, and projections of outlays may not accurately anticipate this speed-up. Third, unforeseen

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1. For a more detailed discussion of the Byrd Amendment, see Congressional Budget Office, "Major Financial Changes in the Highway Trust Fund Since 1956," Staff Working Paper (unpublished), November 1982.

events such as another oil embargo may lead to conditions substantially different than those projected.

Because of such uncertainties, the protection offered by the Byrd Amendment does not necessarily ensure that the Highway Trust Fund will have sufficient cash to meet its liabilities. To protect against this contingency, the Fund should maintain a cash balance sufficient to cover unforeseen reductions in revenues and unanticipated increases in outlays. Based upon the experience of the last decade, a cash balance of around $3.5 billion appears to be the minimum necessary to protect against unforeseen variations in some future year. In estimating the tax implications of the three alternatives examined here, this minimum cash balance is assumed as a requirement of prudent financial management.

Current Spending Option

If current spending levels are continued (as detailed in the 1982 Senate proposal, S. 2574) the cash balance would fall from its current value of $9.0 billion to around $4.6 billion at the end of 1986 (see Table 12). This is not much above the $3.5 billion minimum balance required for prudent management. In particular, it means that in 1987 and later years receipts would need to cover outlays because little additional cash could be obtained by drawing down the Trust Fund balance. This would force the Congress either to increase highway user taxes at that point or to reduce program authorizations. In other words, although current spending trends could continue under current user tax rates through 1986, such a policy could not be sustained thereafter. Alternatively, a small tax increase now would permit the cash balance to be drawn down over a longer period of time.

Increased Program Level

The increased program level option assumes a tax increase for highway programs equivalent to four cents per gallon, as has been proposed by Secretary of Transportation Drew Lewis. This combination of program levels and taxes would maintain the cash balance in the Highway Trust Fund well above the minimum prudent level (see Table 13). Indeed, rather than drawing down the cash balance, this option would actually increase it from $9.0 billion at present to $14.4 billion at the end of 1986. A somewhat smaller initial tax increase would support the option, but this financing package offers a temporary budget advantage.

Redirected Federal Role

Without a tax increase, a refocused federal role would draw down the cash balance below the prudent minimum by 1986 (see Table 14). This could be prevented if federal highway taxes were increased by the equivalent of

TABLE 12. THE HIGHWAY TRUST FUND UNDER A CONTINUATION OF CURRENT SPENDING PATTERNS (In millions of dollars)

Fiscal Year	Authorizations a/	Outlays b/	Trust Fund Receipts c/	Cash Balance Start of Year	Change	Cash Balance End of Year
1983	8,710	8,260	7,820	9,020	(440)	8,580
1984	9,800	8,740	8,010	8,580	(730)	7,850
1985	9,800	9,410	7,950	7,850	(1,460)	6,390
1986	10,250	9,710	7,920	6,390	(1,790)	4,600

a. Total authorizations from the Highway Trust Fund including certain programs already enacted into law and programs (such as safety grants) under the jurisdiction of other committees.

b. Estimated by the Congressional Budget Office.

c. Treasury forecast of tax receipts together with the Congressional Budget Office estimate of interest rates.

TABLE 13. THE HIGHWAY TRUST FUND UNDER THE INCREASED PROGRAM OPTION (In millions of dollars)

Fiscal Year	Authorizations a/	Outlays b/	Trust Fund Receipts c/	Cash Balance Start of Year	Change	Cash Balance End of Year
1983	12,580	8,920	12,180	9,020	3,260	12,280
1984	13,050	11,280	12,860	12,280	1,580	13,860
1985	13,650	12,340	12,960	13,860	620	14,480
1986	14,580	13,090	13,010	14,480	(80)	14,400

a. Total authorizations from the trust fund including programs already enacted into law.

b. Estimated by the Congressional Budget Office based on the assumption that obligations equal authorizations.

c. Treasury forecast of tax receipts based on a four-cent-per-gallon increase in the motor fuels tax together with the Congressional Budget Office estimate of interest rates.

TABLE 14. THE HIGHWAY TRUST FUND UNDER A REDIRECTED FEDERAL ROLE (In millions of dollars)

Fiscal Year	Authorizations	Outlays a/	Trust Fund Receipts b/	Cash Balance Start of Year	Change	Cash Balance End of Year
1983	10,500	8,270	7,820	9,020	(450)	8,570
1984	10,500	9,670	7,960	8,570	(1,710)	6,860
1985	10,500	10,100	7,770	6,860	(2,330)	4,530
1986	10,500	10,240	7,720	4,530	(2,520)	2,010

a. Estimated by the Congressional Budget Office.

b. Treasury forecast of tax receipts together with the Congressional Budget Office estimate of interest rates.

1.4 cents per gallon in 1986. Alternatively, taxes could be increased by an amount sufficient to maintain a cash balance of at least $3.5 billion in the Highway Trust Fund throughout the four-year life of the program. A change equivalent to an increase of three-tenths of a cent per gallon in the tax on motor fuels would be sufficient to do this.

A second variation would be to increase federal taxes by an amount sufficient to provide a temporary turnback to the states of $2.6 billion per year, compensating them for the federal programs discontinued under this option. This would require a tax increase equivalent to around 2.7 cents per gallon--0.3 cents to keep the cash balance above $3.5 billion and 2.4 cents to generate $2.6 billion a year for the turnback. The 2.4 cents could be phased out over the next four years as an incentive for the states to develop their own financial resources.

Extension of the Highway Trust Fund

The options also differ in the degree to which they would restrict future program financing choices. Because of the normal two- to three-year delay between the time funds are authorized and the time they are actually spent, the Highway Trust Fund has always been extended beyond the last year of full highway authorizations. This permits the level of unpaid authorizations to exceed cash on hand and yet ensures that revenues will be available when needed. Since 1978, the Trust Fund has been extended for two years beyond the last year of full highway authorization. Under both the current spending option and the option of a refocused federal role, the Fund would have to be extended for three years beyond the last authorization or to 1989. A shorter extension would be possible, but only if these options were financed through a tax increase rather than by reducing the cash balance. Under the increased spending option, with its large tax increase, the cash balance in the Fund would be large enough to require extension only to 1987, one year beyond the last year of full authorization.

There is an important disadvantage in extending highway user taxes far beyond the life of the program they finance. This is that in the future taxes might have to be increased simply to maintain existing program levels. Such an approach does not encourage a balanced consideration of highway taxes and expenditures.

Highway Cost Allocation

The increased spending option requires higher federal highway taxes; an increase equivalent to a four-cents-per-gallon tax on motor fuels has been assumed as part of this option. This would generate almost $4.4 billion a year in revenues for the Highway Trust Fund, about 60 percent more than current taxes. If tax changes were made in line with what different classes of vehicles contribute to highway costs, the taxes paid by each vehicle class

would not all be increased in proportion to current payments. 2/ Automobile users, for example, pay highway taxes roughly in line with their share of federal highway costs and thus would expect a roughly 60 percent increase in their taxes--from about $25 a year to $42 a year in 1985 (see Table A-1 in Appendix A). Single-unit trucks pay, on average, about twice their share of federal costs and might reasonably have an overall reduction in their federal highway taxes--from an average of $253 per year to $205 per year. Semitrailer combination vehicles currently pay only about 80 percent of their share of federal highway costs. Their annual taxes should be doubled to about $2,850 in order to make up their current underpayment and to cover their share of increased highway taxes.

The largest combination trucks are over 75,000 pounds in gross vehicle weight and currently pay less than 60 percent of their share of federal costs. Under this principle, they would face by far the largest tax change, an increase of about $3,150 to almost $5,000 a year. This would raise average costs for these trucks by between 2 and 2.5 percent. Actual costs vary, of course, and some vehicles might experience higher percentage increases than the averages given here, particularly if they are driven relatively few miles. While clearly requiring some adjustments, such an increase for this heaviest class of trucks would be unlikely to cause any significant shift of traffic from truck to rail.

IMPACT ON THE BUDGET DEFICIT

Any change in the cash balance of the Highway Trust Fund translates directly into a change in the federal deficit (or surplus). Because the Highway Trust Fund is part of the unified federal budget, its receipts and outlays are consolidated with total federal revenues and outlays. For example, an increase in the cash balance for a particular year means that trust fund receipts have exceeded outlays, reducing the overall federal deficit. Similarly, when the cash balance declines the deficit increases.

Under the current spending option, the cash balance would be reduced by about $4.4 billion over the next four years, increasing the deficit by a corresponding amount. Most of this effect would come in fiscal years 1985 and 1986. The option of a redirected federal role, assuming no increase in taxes, would have a similar but somewhat larger effect on the deficit.

The increased program option would provide significant short-term help on the deficit because it would be financed by a substantial increase in user taxes. The effect on the deficit would be less than the change in the cash

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2. The cost estimates used here are based on a recent DOT study. See U. S. Department of Transportation, Final Report on the Federal Highway Cost Allocation Study, pursuant to Section 506 of Public Law 95-599, May 1982.

balance, however, since increased highway taxes would result in somewhat reduced corporate tax collections. For 1983, the net reduction in the deficit would be somewhat less than $3 billion. In later years, as outlays matched revenues, there would be no effect or a small increase in the deficit.

CONCLUSIONS

In order to maintain the nation's major roads and complete the Interstate Highway System, the Congress could move in either of two directions: it could increase federal spending to keep pace with needed repairs; or it could redefine the federal role in the highway program, turning back to states the responsibility for all roads and programs not essential to connect the nation's major cities and industrial activities. Continuation of the current spending pattern remains possible in the short run, but it would mean increasing deterioration of the nation's highways. Either the federal government must respond or the states will be forced to fill the gap. The salient characteristics of each major option are described in Table 15.

If current policies were continued, the federal expenditure on roads could be held down, but needed repairs would continue to be deferred because of inadequate funding. While this approach could avoid an increase in highway taxes for at least several years, it would also intensify the financial pressures on state governments, especially in areas where their needs are greatest and where the likelihood of future federal assistance is seen as most improbable. Uncertainty about specific future financial responsibility at each level of government could defer many needed repair projects, and the real long-run cost of maintaining the nation's essential roads might be driven up as a result. In addition, by drawing down the cash balance of the Highway Trust Fund, this option would increase the federal deficit by a total of $4.4 billion during the next four years.

The increased program level option would cost the federal government more than the other approaches, at least in the short run. It would raise Highway Trust Fund authorizations from $8.6 billion in 1982 to an average of $13.5 billion per year over the next four years. This would be applied across all programs, with the largest increase reserved for Interstate repair and reconstruction. The higher spending should help to hold down the long-run costs of keeping the nation's essential routes in safe operating condition. It could also help improve the nation's overall economic efficiency. An increase in federal user fees equivalent to four cents per gallon of motor fuel would be sufficient to pay for this program, and would have the further advantage of helping to reduce the federal deficit. Because highway tax receipts would increase more rapidly than highway spending under this approach, the federal deficit would be smaller by a total of $5.4 billion over the next four years.

The redirected federal role would ensure adequate funding for the principal routes that connect the nation's major centers and that carry more

TABLE 15. SUMMARY OF MAJOR HIGHWAY OPTIONS

Criteria	Current Policy	Increased Program Levels	Redirected Federal Role
Average Annual Authorization, 1983-1986 (In billions of dollars)	9.6	13.5	10.5
Adequacy to Meet Highway Needs	Not adequate	Generally adequate; more funds would be required for Interstate repair	Adequate for Interstate and Primary; all other systems would rely exclusively on states
Timing of Tax Increase	Could wait until 1987	Necessary now	Could wait until 1986
Burden on States	Current financial pressures on states would continue to mount as federal aid remained inadequate	No burden. The increase in federal programs would help alleviate financial pressure on states	Major increases in state activity would be required, often forcing states to increase state user fees
Effect on Long-Run Costs of Maintaining Essential Roads in Repair	Costs would probably be driven up by inefficient deferral of repairs	Costs would be reduced if increased funding was targeted on needed repairs to essential routes	Costs for Interstate and Primary would be reduced
Effect on Deficit	Deficit would increase by $4.4 billion over four years	Deficit would decrease by $5.4 billion over four years [a/]	Deficit would increase by $5.5 billion over four years

a. Does not include any reduction in receipts from income taxes.

than half of intercity highway traffic. This program could be financed without a tax increase, although it would add to the federal deficit in the near term and would sharply increase state financial responsibilities without increasing their revenues. Because of these substantial disadvantages, it might be preferable to consider a simple variation to this option. For example, by returning $2.6 billion annually to the states to pay for their Secondary and Urban routes and other locally important projects, the federal government could provide financial backing that would more than cover their new program responsibilities. Even though it would mean a temporary increase in federal highway taxes, it would better align the highway responsibilities of each level of government. The federal government would become more fully involved in the repair of major intercity roads, and the states and counties would assume full responsibility for all other routes. The $2.6 billion that the federal government would contribute to support those systems could be phased down once the states had had time to get their own programs and financing established by their legislatures. In the long run, this realignment of roles would simplify the highway program, making it more responsive to the specific needs and priorities of the units of government that are most affected by any particular route system.

APPENDIXES

APPENDIX A. HIGHWAY COST ALLOCATION

Some groups of drivers use highways more than other groups. It is generally agreed that users should pay for the highway costs that they themselves occasion. The Department of Transportation (DOT) has recently completed the first complete allocation study of federal highway costs and revenues in almost 20 years. 1/ It represents a significant improvement over previous studies of this sort, chiefly because it assigns to each group of road users costs proportional to the wear and tear that they cause. Because the new method assigns costs fairly, a system of user fees based upon it would encourage efficient use of the transportation network.

DOT's highway cost allocation study shows that payments by automobiles and pickups and vans roughly match their share of federal highway costs, but that this is not the case for trucks (see Table A-1). Light trucks overpay, while heavy trucks underpay. For example, single-unit trucks as a group currently pay almost twice their fair share, and should have a major reduction in their federal highway taxes--possibly through an exemption from the taxes on truck sales and truck parts. (Some of the heaviest single-unit trucks--dump trucks, for example--underpay.) Semitrailer combination trucks, on the other hand, currently underpay by 20 percent. Within this class of vehicles, the degree of underpayment increases rapidly with vehicle size. Some of the heaviest trucks, those over 75,000 pounds gross vehicle weight, should pay almost 70 percent more in federal highway taxes than they do at present.

Fair-Share Tax Increases

If all highway user taxes were increased in equal proportion to finance the House bill, the increase in taxes paid by each user group would vary widely. An increase in the motor fuel tax would be a particularly unsatisfactory way to restore tax balance, since over 80 percent of it is paid by passenger vehicles (autos, motorcycles, buses and pickups, and vans). Very little is paid by the heaviest trucks, those vehicles that the cost allocation study shows pay the least relative to their costs. On the other hand, if new taxes were set in line with the cost responsibility of each group, passenger vehicles would be assigned only about 60 percent of the increase while payments by combination trucks would more than double to about $2,800 a year (see Table A-1). Users of single-unit trucks, on the

1. U. S. Department of Transportation, Final Report on the Federal Highway Cost Allocation Study, pursuant to Section 506 of Public Law 95-599, May 1982.

TABLE A-1. SUMMARY OF RESULTS FROM DOT's HIGHWAY COST ALLOCATION STUDY (In dollars per vehicle for 1985)

Vehicle Class	Current Highway Program			Payments Under Taxes for House Bill ($11.7 billion a year)	
	Payments	Costs a/	Ratio of Payments to Costs	Based on Cost Allocation Results	Based on Fuel Tax Increase Alone
Automobiles	25	26	0.97	42	46
Buses	6	191	0.04	306	9
Pickups and Vans	40	37	1.08	59	71
Single-Unit Trucks	253	128	1.99	205	321
Combination Trucks	1,411	1,778	0.80	2,850	1,790
Over 75,000 pounds	1,819	3,101	0.59	4,970	2,331
All Vehicles	46	46	1.00	74	73

NOTE: Estimates based on program mix assumed by DOT's cost allocation study. A shift in effort toward more reconstruction or away from local roads, as proposed by the needs-based option, would probably increase the cost responsibility of combination trucks relative to lighter vehicles.

a. This also approximates the payments that would be required under both the Senate highway bill and the option of a redirected federal role if the cash balance were to be reduced and taxes realigned as suggested by the highway cost allocation study.

other hand, would receive a tax reduction of about $18 per year, 7 percent of their current payments. Lighter passenger vehicles would pay a tax increase roughly in proportion to their current tax payments, an increase averaging about $24 per year over their current $25. The heaviest classes of trucks (those over 75,000 pounds) would face a tax increase of about 210 percent to $5,700 per truck a year.

Put another way, in order for each group of users to pay its fair share of the overall highway bill, more than an across-the-board increase in taxes would be required. The most difficult issues would be raised by the heaviest vehicles, for which the tax increases would be largest. For example, the heavy vehicle use tax could be graduated so as to bring the tax payments by each group into line with its cost responsibility. If that was the only tax to be increased, trucks over 75,000 pounds would have to pay $58 per thousand pounds per year instead of $3 as at present. Alternatively, if the tax on diesel fuel was the only one to be increased, it would have to be raised to 26 cents per gallon in order for trucks over 75,000 pounds to pay their share of costs. (In that case, however, a system of rebates would be required to refund over $20 billion so that all other vehicle classes would not overpay.)

Such extreme increases could be moderated by a combination of tax changes designed to achieve a general balance between payments and responsibility. Several alternatives were suggested in the DOT cost allocation study. One alternative, shown in Table A-2, changes eight specific taxes. It would raise $5.3 billion in additional revenue, and would result in each class of vehicles (except motorcycles) paying within 10 percent of its allocated costs. A smaller tax increase would be required if existing tax exemptions were removed.

Losses Due to Tax Exemptions

The most extreme examples of users whose highway taxes are out of line with the costs they impose are those who are exempt from paying certain taxes. About $750 million a year is lost to the trust fund because of these exemptions. These exempt groups include state and local governments, buses (intercity, transit, and school buses), and producers of alcohol fuels. 2/ In addition, off-road users--primarily farmers--are exempt from paying highway taxes. For off-road users the amount lost is extremely difficult to estimate, and enforcement is probably impractical in any case.

Table A-3 summarizes the major exemptions and their estimated costs. Abolishing these subsidies would increase revenues by an amount equal to a

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2. The fuel tax exemption for alcohol fuel producers amounts to 10 times the federal tax or 40 cents per gallon, since each gallon of gasohol contains only 10 percent alcohol. Several states have additional exemptions/subsidies for producers of alcohol fuel.

TABLE A-2. AN ALTERNATIVE SET OF HIGHWAY TAXES FOR THE INCREASED PROGRAM OPTION

Tax	Current Rates	New Rates
Gasoline	4 cents per gallon	7.8 cents per gallon
Diesel and Special Fuels	4 cents per gallon	10.4 cents per gallon
Lubricating Oil	6 cents per gallon	No tax
Tires	9.75 cents per pound	13.0 cents per pound for 0-50 pounds; 26.0 cents per pound for 50-100 pounds; 39.0 cents per pound for over 100 pounds
Inner Tubes	10 cents per pound	No tax
Tread Rubber	5 cents per pound	39.0 cents per pound
New Vehicle Tax	10 percent of manufacturer's wholesale price for trucks, tractors, and trailers over 10,000 pounds GVW	10.7 percent for trucks, tractors, and trailers over 33,000 pounds GVW
Parts and Accessories	8 percent of manufacturer's wholesale price for truck, tractor, and trailer parts	10.7 percent for trucks, tractors, and trailers over 33,000 pounds GVW
Heavy Vehicle Use Tax	$3.00 per 1,000 pounds GVW over 26,000 pounds	GVW: 60,000-70,000 — Tax per 1,000 lbs.: $ 2.34 GVW: 70,000-75,000 — Tax per 1,000 lbs.: 24.18 GVW: Over 75,000 — Tax per 1,000 lbs.: 46.93

SOURCE: Current law plus Option 3 from Department of Transportation, Final Report on the Federal Highway Cost Allocation Study.

GVW = Gross Vehicle Weight.

TABLE A-3. COST OF MAJOR EXEMPTIONS FROM FEDERAL HIGHWAY TAXES (In millions of dollars)

Exemption	Estimated Average Annual Cost, 1983-1986 a/
State and Local Governments	370
Transit Buses	89
School Buses	85
Intercity Buses	32
Other Private Buses	67
Alcohol Fuels	116
Exemption of Federal Vehicles from Heavy Vehicle Use Tax	1
Total	760

SOURCE: U. S. Department of Transportation, Final Report on the Federal Highway Cost Allocation Study, May 1, 1982, p. I-24, estimate for 1985.

a. The exemption for fuel-efficient taxicabs is scheduled to expire at the end of calendar year 1982. For 1982, its cost is estimated at $4 million.

tax of two-thirds of a penny on motor fuel. While the subsidies have little economic rationale, ending them would create some short-term financial problems. In particular, state and local governments would need to find almost $550 million in new revenues (or reduced services)--$370 million for direct highway use, $90 million for transit, and $85 million for school buses.

APPENDIX B. RELATIONSHIP BETWEEN HIGHWAY AUTHORIZATIONS AND OUTLAYS

Outlays are the last of a three-step process running from authorizations to obligations to outlays. Once a particular authorization has become available to the states (in budget jargon, has been apportioned among the states) it is available for obligation. An obligation is created when a state signs a contract with a construction firm to perform a particular piece of work on a particular highway segment. Once the work has been completed, the federal government is obligated to pay its share of the project's cost to the state, which then pays the contractor. This is called an outlay.

On average, the time between authorization and obligation is less than two years. Obligations, in turn, reach the outlay stage in a little over two years although the process may take seven years or more. On average, the total time from authorization to outlay is about three years.

This lag between authorization and outlay explains why it is possible for the level of liabilities (unpaid authorizations) to exceed cash on hand. At the end of 1982, for example, total liabilities are projected to be about $19.3 billion. With a cash balance of about $9.0 billion, unfunded liabilities will be $10.3 billion. Since annual Trust Fund receipts are predicted to be about $8.1 billion over the next four years, 1.3 years of additional revenues will be required to finance the unfunded liabilities. This "overhang" has been fairly typical of the Trust Fund in recent years.

While the number of years of Trust Fund overhang is a useful measure of changes in the financial status of the Trust Fund, there is no agreement as to what level would represent a high degree of risk. Risk would be zero, of course, if unfunded liabilities were eliminated--that is, if the cash balance was equal to unpaid authorizations. From a cash flow standpoint, such a strict standard is unnecessary so long as the Trust Fund is expected to continue.

A more reasonable yardstick would be to examine the expected lapse of time between authorizations and outlays. Experience suggests two years as a prudent maximum for the years of overhang. If overhang exceeds this, it may be a sign that the system is heading toward eventual insolvency.

TABLE C-1. GASOLINE TAXES BY STATE

State	Current Tax (cents per gallon)	Year Last Change Made by State Legislature	Change (cents per gallon)
Alabama	11.0	1979	4.0
Alaska	8.0	c/	c/
Arizona	10.0 a/	1981	2.0
Arkansas	9.5	1978	1.0
California	7.0 a/	c/	c/
Colorado	9.0	1980	2.0
Connecticut	11.0	c/	c/
Delaware	11.0	1980	2.0
District of Columbia b/	14.0	1981	1.0
Florida	8.0	c/	c/
Georgia	7.5	c/	c/
Hawaii	8.5	c/	c/
Idaho	12.5	1981	1.0
Illinois	7.5	---	c/
Indiana	11.1	1981	0.6
Iowa	13.0	1980	2.0
Kansas	8.0	c/	c/
Kentucky b/	10.0	1981	0.4
Louisiana	8.0	c/	c/
Maine	9.0	c/	c/

(Continued)

TABLE C-1. (Continued)

State	Current Tax (cents per gallon)	Year of Last Change	Change (cents per gallon)
Maryland	11.0 a/	1981	2.0
Massachusetts b/	10.4	1981	1.0
Michigan	11.0	1978	2.0
Minnesota	13.0	1980	4.0
Mississippi	9.0	c/	c/
Missouri	7.0	c/	c/
Montana	9.0	1978	1.0
Nebraska b/	14.0	1981	0.1
Nevada	12.0	1981	1.5
New Hampshire	14.0	1980	3.0
New Jersey	8.0	c/	c/
New Mexico b/	10.0	1980	2.0
New York	8.0	c/	c/
North Carolina	12.25	1980	2.75
North Dakota	8.0	c/	c/
Ohio b/	11.7	1981	1.4
Oklahoma	6.58	1980	0.08
Oregon	8.0	1980	1.0
Pennsylvania b/	11.0	1978	2.0
Rhode Island b/	11.0	1981	1.0

(Continued)

TABLE C-1. (Continued)

State	Current Tax (cents per gallon)	Year of Last Change	Change (cents per gallon)
South Carolina	13.0	1980	2.0
South Dakota	13.0	1980	1.0
Tennessee	10.0	1980	3.0
Texas	5.0	c/	c/
Utah	11.0	1980	2.0
Vermont	11.0	1980	2.0
Virginia b/	11.0	1979	2.0
Washington b/	12.0	1981	1.5
West Virginia	10.5	1977	2.0
Wisconsin	13.0	1980	4.0
Wyoming	8.0	c/	c/

a. Future increase in taxes already enacted.

b. States with variable tax rate.

c. No change in taxes over last four years.